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EXAMINER
LUHRS, MICHAEL K

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2824	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/677,438	**Applicant(s)** ESTEPA ET AL.	
	Examiner Michael K. Luhrs	**Art Unit** 2824	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *16-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-20* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *22 April 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *search history*.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-15, drawn to method, classified in class 438, subclass 109.

   II. Claims 16-20, drawn to device, classified in class 257, subclass 678.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by another and materially different process, i..e such as using a protective layer over bond pad or using a non-corrosive over a metal bondpad, e.g. tin.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Attorney Ortega on 10/15/04 a provisional election was made without traverse to prosecute the invention of Group I method, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-20 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Inventorship

6. It is noted that "Kazuaki, Ano", identified as a named inventor in the Declaration dated April 15, 2004, but no request under 37 CFR 1.48, as is required, was filed. Any request to add an inventor must be in the form of a request under 37 CFR 1.48. See MPEP Appendix R - Patent Rules § 1.48. Applicant is advised that petition to correct Inventorship is needed.

Specification

7. Claims 1-15 are objected to because of the following informalities:

   a. In claim 1, the preamble states "a method of assembling an integrated circuit assembly", while the specification reads as a "disclosed surface treatment" (line 15, p. 9). Claim 1 fails to describe the invention as a surface treatment performed during assembly of a chip and substrate to a PCB (printed circuit board). See applicant's "Title" of invention.

   b. Claim 9 recites "removing the anti-tarnish coating from the bondpad with flux" in line 2, while the specification recites that the flux is selected to "assist in the removal" line 7, p. 12.

8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

c. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

i. The omitted steps are:

(1) "the soldering of the bond pads to the traces on the PCB" (printed circuit board), according to applicant's method step in Fig. 2 as step '265', and, as stipulated in the specification, lines 13-15, p.12. Claim 1 (lines 8-9), recites "removing oxidation from the bond pad, the bond pad adapted to be metallurgically bonded to a trace on a printed circuit board". Apparently, the applicant is merely *suggesting* that a bonding connection may be forthcoming. Claim 1 fails to actually recite a method step for performing the bondpad connection to the PBC as recited as "soldering of the bond pads to the traces on the PCB" of applicant's step 265.

(2) The actual wiring step of "the integrated circuit component having lead adapted to be wire-bonded to the terminal" is absent. Claim 1 (lines 5-6), recites "the integrated circuit component having lead adapted to be wire-bonded to the terminal". Apparently, the applicant is merely *suggesting* that "the mounting[ed] integrated circuit chip" have the integrated circuit component (sic) [chip] have a lead adapted to be wire-

bonded to the terminal (of the substrate first side). Claim 1 fails to actually recite a method step for performing a wire bonding of the terminal on the substrate's first side to the chip.

d. Claim 1, line 6, reads "component". While the applicant can be his own lexicographer, and while the applicant *may have intended* that the "component" of line 6 be as a synonym for the "chip" in line 5, there is insufficient antecedent basis for "component" limitation in the claim.

e. Claim 3 recites the limitation "prior to coating the bondpad" in line 1. There is insufficient antecedent basis for this limitation in the claim. Applicant's Fig. 2, step 245, stipulates an anti-tarnish coating, yet such is absent from claim 3. i.e. suggested change to: --prior to coating the bondpad with anti-tarnish coating--

f. Claim 13 recites the limitation "coating the bondpad" in line 1. There is insufficient antecedent basis for this limitation in the claim. There is no mention of such coating of the bond pad in any of claims 12, 11, 10, 8 or 1.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1-2 and 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haji et. al. USPN 5,909633 in view of Arldt et. al. USPN 5,531,838, (or, Haji et. al. *and* Arldt et. al.).

Regarding claim 1, Haji et. al. teach the *method of assembling an integrated circuit assembly, the method comprising*: *providing a substrate* (substrate 11, line 27, column 3) *having electrical terminals on a first side of the substrate and a bondpad on a second side of the substrate opposing the first side,* (as top side electrode 14, copper pad 21, lines 27-28, column 3 and bottom side electrode 16 with copper pad 24, lines 31-32, column 3, as shown in Fig. 2), *the bondpad electrically coupled to at least one of the terminals;* (electrode 14 and electrode 16 are connected through internal wiring 18, lines 19-20, column 3, also shown in Fig. 2) *mounting an integrated circuit chip to the first side of the substrate,* (as mounting of semiconductor layer 12, *is* a semiconductor element, see line 11, column 3, i.e. the semiconductor element 12 is fixed on the substrate 11, in lines 44-45, column 3, as shown in Fig. 3) *the integrated circuit component having a lead adapted to be wire-bonded to the terminal;* (a gold wire 15 lead, is bonded on gold layer 23 of the top side electrode 14 by wire bonding, lines 32-33, column 4). There are two ways Haji et. al. removes oxidation from the pad:

1) By using an Argon etching process, "in this way the gold layer 62 is thinned" (line 9-10, column 6) using the apparatus in Fig. 14, shown with the substrate 11 inverted, and exposing the pads 16 to the etchant gas. (This is for gold pad).

2) Haji et. al. teach flux application to the bondpad (lines 15-17, column 6), (this is for oxidation removal before soldering).

3) Also notable is that Haji et. al. teach etching to (originally) form the copper (in line 9, column 5).

Haji et. al. teach adaptation for metallurgically bonding since a solder ball is attached for later attachment to a PCB.

Haji et. al. teach flux, but only fails to explicitly teach that the flux will *remove oxidation from the bondpad.* Haji et. al. fails to actually mention the PCB.

Arldt et. al. teach *removing oxidation from the bondpad,* by applying flux, wherein the flux comprises pimelic acid 1%+ is necessary for the removal of oxides (lines 65, column 3, line 1 column 4) is thus *removing oxidation from the bondpad* see the module contacts pads (in lines 45-47, column 5) flux is applied thereto, for the metallurgical connection (lines 29-30, column 5) to PCB solder regions (line 54, column 5), i.e. traces of the PCB, therefore *the bondpad* is *adapted to be metallurgically bonded to a trace on a printed circuit board.* Since Haji et. al. and Arldt et. al. are all interested in manufacturing the electronic component, the purpose of applying flux for oxidation removal in assembly of an electronic component to a PCB as taught by Arldt et. al. would have been recognized by Haji et. al. who teach the module assembly, and similarly, the purpose of assembly of the module as taught by Haji et. al. would have been recognized by Arldt et. al. as being one method of assembly for the module to which Arldt et. al. refer. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply flux to remove oxide in the assembly of the electronic component to the PCB, with the acid level taught by Arldt et. al. in (lines 60, column 3- line 5, column 4), for removal of oxide; for the purpose of good solder surface tension; and low remaining residue. In summary, flux removes oxidation.

Regarding claim 2, Haji et. al. teach *a method according to claim 1, wherein removing oxidation comprises etching oxidation from the bondpad using an etchant*, by using an Argon gas etchant (line 1, column 6 and line 8, column 6). Furthermore, Haji et. al. and Arldt et. al. teach *a method according to claim 1, wherein removing oxidation comprises etching oxidation from the bondpad using an etchant*, by using flux. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use flux as an etchant or Argon gas to remove oxidation because of the improved solder connection.

Regarding claim 14, Haji et. al. fails to bond to the trace; wherein *metallurgically bonding comprises metallurgically bonding the bondpad to the trace using a solder ball* is taught by Arldt et. al.. Since Haji et. al. and Arldt et. al. are all interested in manufacturing the electronic component, the purpose of Haji et. al.'s solder ball is to bond to the trace of a PCB as shown by Arldt et. al.. It would have been obvious at the time the invention was made to a person having ordinary skill in the art that Haji et. al.'s module can be attached to Arldt et. al.'s PCB trace using Haji et. al.'s solder ball for the very purpose of attaching the chip onto the PCB.

Regarding claim 15, Haji et. al. encapsulates in Fig. 13, as encapsulant resin mold '19' (line 41-42, column 5) And further argon etches in Fig. 14 showing the encapsulated chip inverted (line 8, column 6).

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haji et. al. and Arldt et. al. as applied to claim 2 above, and further in view of Malladi et. al. USPN 4,714,517.

Regarding claim 3, Arldt et. al. and Haji et. al. fail to teach *rinsing the etchant with deionized water*. Malladi et. al. teach an etchant, for removing surface layer of copper, as well as oxides (lines 18-20, column 2), using a acid bath and then rinsed (line 20, column 2) *prior to coating the bondpad* such as electroless plating with gold (lines 31-34, column 3). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to rinse the etchant with de-ionized water so that, both, the etchant, and the oxidation that was removed by the etchant, could be rinsed away from the bondpad surface for the reason of having a clean surface on which to electroplate the gold.

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haji et. al. and Arldt et. al. as applied to claim 2 above, and further in view of Brusic et. al. USPN 5,960,251.

Regarding claim 3, Arldt et. al. and Haji et. al. fail to teach rinsing the etchant prior to coating the bondpad. Haji et. al. teach coating the bondpad with gold. Brusic et. al. teach other etchants such as liquid etchants, wherein a rinsing step is performed (line 30, column 3). Since Arldt et. al., Haji et. al. and Brusic et. al. are all from the same field of endeavor, the purpose disclosed by Brusic et. al. would have been recognized by Arldt et. al. and Haji et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to etch the copper pad as taught by Haji et. al. and then rinse as taught by Brusic et. al. for the obvious purpose of rinsing off the etchant from the bondpad prior to coating the gold, for good gold contact to the copper.

16. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arldt et. al. and Haji et. al. as applied to claim 2 above, and further in view of Arabinick USPN 5,855,805.

Regarding claim 4, Haji et. al. teaches the copper pad in line 7, column 5. Haji et. al. and Arldt et. al. fail to teach etchant of potassium peroxymonosulfate. Arabinick teaches potassium peroxymonosulfate as prior art etchant in line 1 column 11 for the purpose of microetching copper. Since Arldt et. al. and Haji et. and Arabinick are all from the same field of endeavor, the purpose disclosed by Arabinick would have been recognized by Arldt et. al. and Haji et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to etch the copper pad as taught by Arabinick using potassium peroxymonosulfate since this etchant is taught to etch copper pads on substrates prior to coating the gold, for good gold contact to the copper.

Regarding claim 5, Haji et. al. and Arldt et. al. fail to teach the amount of potassium peroxymonosulfate. Arabinick teaches 167.2 grams per 900 ml of water in lines 4-6, column 11. Since Arldt et. al. and Haji et. and Arabinick are all from the same field of endeavor, the purpose disclosed by Arabinick would have been recognized by Arldt et. al. and Haji et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to etch the copper pad as taught by Arabinick using potassium peroxymonosulfate of 167.2 grams per 900 mL water added since this is prior art for microetching copper. Albeit, Arabinick's value of 167.2 g/900 ml water is a higher concentration than that of the applicant's range of 80 to about 120 g/liter, generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. See MPEP 2144.05 [R-1] II. Obviousness of Ranges:

> "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the concentration of the potassium peroxymonosulfate in the water to produce the best etching results.

Regarding claim 6, Haji et. al. and Arldt et. al. fail to teach etchant further comprises sulfuric acid. Arabinick teaches sulfuric acid in lines 10-11, column 11, (in the amount of 13.5 ml of the 0.29M, thus 1.5% of the 0.29M is by volume 13.5ml/900ml water x 100=1.5%). See line 59, column 11. By volume, 1.5% is within applicant's range of 1% to 3%. Since Arldt et. al., Haji et. and Arabinick are all from the same field of endeavor, the purpose disclosed by Arabinick would have been recognized by Arldt et. al. and Haji et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to add the sulfuric acid from about 1% to 3% by volume since this is taught as prior art by Arabinick for the purpose of microetching and cleaning the copper. Again,

> "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art that the concentration of the sulfuric acid per the volume of the water could be optimized to produce the best etching results.

Regarding claim 7, Haji et. al. and Arldt et. al. fail to teach the method of claim 6, wherein etching is at room temperature. Arabinick teaches the etching as discussed above at 90°F is about room temperature (see line 6-7, column 11). Since Arldt et. al., Haji et. and Arabinick are all from the same field of endeavor, the purpose disclosed by Arabinick would have been recognized by Arldt et. al. and Haji et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to etch at room temperature since this is prior art taught by Arabinick for etching the copper.

17. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haji et. al. and Arldt et. al. as applied to claim 1 above, and further in view of Brusic et. al. USPN 5,960,251. Brusic et. al. teach etching the bond pad and, *further comprising coating the bondpad with an anti-tarnish solution after removing oxidation,* such as benzotriazole: benzotriazole is a corrosion inhibitor (line 38, column 3), therefore an *anti-tarnish*. Since Arldt et. al. and Haji et. al. and Brusic et. al. are all interested in manufacture of the component, the purpose disclosed by Brusic et. al. would have been recognized in the pertinent art of Arldt et. al. and Haji et. al.. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply an anti-tarnish coating after the oxidation removal for the very purpose of preventing corrosion during the interim between the oxidation removal and the soldering.

18. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haji et. al. and Arldt et. al. and Brusic et. al. as applied to claim 8 above, in further view of McCormick et. al. USPN 6,431,432.

Haji et. al. and Arldt et. al. and Brusic et. al. fail to teach the anti-tarnish removal with flux. McCormick et. al. teaches that flux selection is important to solderability regarding the interaction with anti-tarnish (OSP), (line 67, column 3 to line 1 column 4). Since Arldt et. al. and Haji et. al. and Brusic et. al. and McCormick et. al. are all interested in manufacture of the component, the purpose disclosed by McCormick et. al. would have been recognized in the pertinent art of Arldt et. al. and Haji et. al. and Brusic et. al.. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply an appropriate flux for the desired interaction with the OSP (anti-tarnish) for good solderability, (line 22, column 4) to occur.

19. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arldt et. al. and Haji et. al. and Brusic et. al. as applied to claim 8 above, and further in view of Yunus et. al. USPN 6,696,757. Arldt et. al. and Haji et. al. fail to coat with anti-tarnish after oxidation removal. Brusic et. al. teach methanol (line 43, column 5) benzotriazole line 26, column 4, and, water, line 37, column 5 (Brusic et. al. only silent on the surfactant). Yunus et. al. teach a solution of methyl alcohol, benzotriazole, nonionic surfactant and water (OSP "organic solderability protectant"), lines 20-26, column 5 for the pad protection. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply the anti-tarnish as taught by Yunus et. al. for the very reason of protecting the pads (from oxidation) during the time period of pad formation to solder ball application. Yunus et. al. has 1% sodium M-nitrobenzene sulfonate, 1% benzotriazole, 90% water, and 8% methanol, (lines 22-24, column 5). It would have been obvious at the time the invention was made to a person having ordinary skill in the art that these values approximate to the ranges of applicant's claim 11, can be optimized:

Optimization Within Prior Art Conditions or Through Routine Experimentation: Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); >see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.").

20. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arldt et. al. and Haji et. al. and Brusic et. al. and Yunus et. al. as applied to claim 11 above, and further in view of Lin et. al. USPN 5,071,520. Regarding claim 12, Lin et. al. teaches that sulfuric acid added to the anti-tarnish is known prior art (line 8, column 4), such as H_2SO_4 (line 61, column 5) as suitable to add to anti-tarnish treatment. Since Arldt et. al., Haji et.al, Brusic et. al., Yunus et. al. and Lin et. al. are all concerned with the copper and plating, the purpose disclosed by Lin et. al. would have been recognized by Arldt et. al. and Haji et. al. and Brusic et. al. and Yunus et. al. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to add the sulfuric acid. Regarding claim 13, Lin et. al. teaches generally, the treatments are at 50-55 degrees (column 5). Since Arldt et. al., Haji et.al, Brusic et. al., Yunus et. al. and Lin et. al. are all concerned with applying the OSP anti-tarnish at the proper temperature, the purpose disclosed by Lin et. al. would have been recognized by Arldt et. al. and Haji et. al. and Brusic et. al. and Yunus et. al..

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Salon et. al. USPN 6,445,075, teach the protective coating. Harada et. al. USPN 6,476,491, teach etching copper oxide from copper pad by Argon sputter etch (lines 59-64, column 12). Tomaiuolo et. al. USPN 6,372,027, teach a solution of methyl alcohol, an azole, a nonionic surfactant and water (example 3, column 3) but fails to teach the *benzotriazole*, per se. Price et. al. USPN 5,800,859, teach a copper coating for PCB, but lacks the methanol. Molla et. al. USPN 6,362,089 teach the persulfate bath followed by a sulfuric acid bath for copper oxide removal (lines 45-48, column 2).

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael K. Luhrs whose telephone number is 571-272-1874. The examiner can normally be reached on M-F, 8-5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael K. Luhrs
11/17/04

11/24/04
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